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BEKASI-EAST JAKARTA AIRPORT
AIR SIDE

Report

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1.1 Location

The main influence on the airport location is the presence of other airports in the area. Since Jakarta has already one airport, the 18 th worldwide, the location has to be selected carefully. Other factors that influenced the airports final location were the ease to provide the airport with good connections to the city and a wide area available in order to increase the airports infrastructure if needed in the future. After considering all those factors, the location decided can be defined by the following coordinates:

- Latitude: 6°08'21"

- Longitude: 107°06'40"

- Altitude: 30meters approximately.

Since the area chosen is extremely marshy, the excavations to deeper levels are going to be avoided as much as possible due to its difficulties and cost. However, that type of terrain gives us some advantage due to its flatness.

1.2 Meteorology

1.2.1 Temperature

The reference temperature of airports is important to be calculated as soon as possible since it has an effect on the performance of the airplanes during the phases of landing and takeoff. In order to calculate this temperature, the definition given by the OACI will be used. OACI states that: "The aerodrome reference temperature shall be the monthly mean of the

daily maximum temperatures for the hottest month of the year (the hottest month being that which has the highest monthly mean temperature). This temperature shall be averaged over a period of years". Taking into account the hypothesis that the temperatures obtained on Soekarno-Hatta Airport can also be used in order to calculate our reference temperature due to the fact that both airports are only separated by a distance of 60 km, a comparison study has been made. The final reference temperature obtained is Tref= 32,38ºC. The temperature values and study is further detailed in the attachments.

1.2.2 Wind

In order to calculate the influence of the winds the first thing done is the graph of the winds intensity and their direction. This graph is commonly called wind rose graph. The graph obtained making use of Microsoft Excel software is:

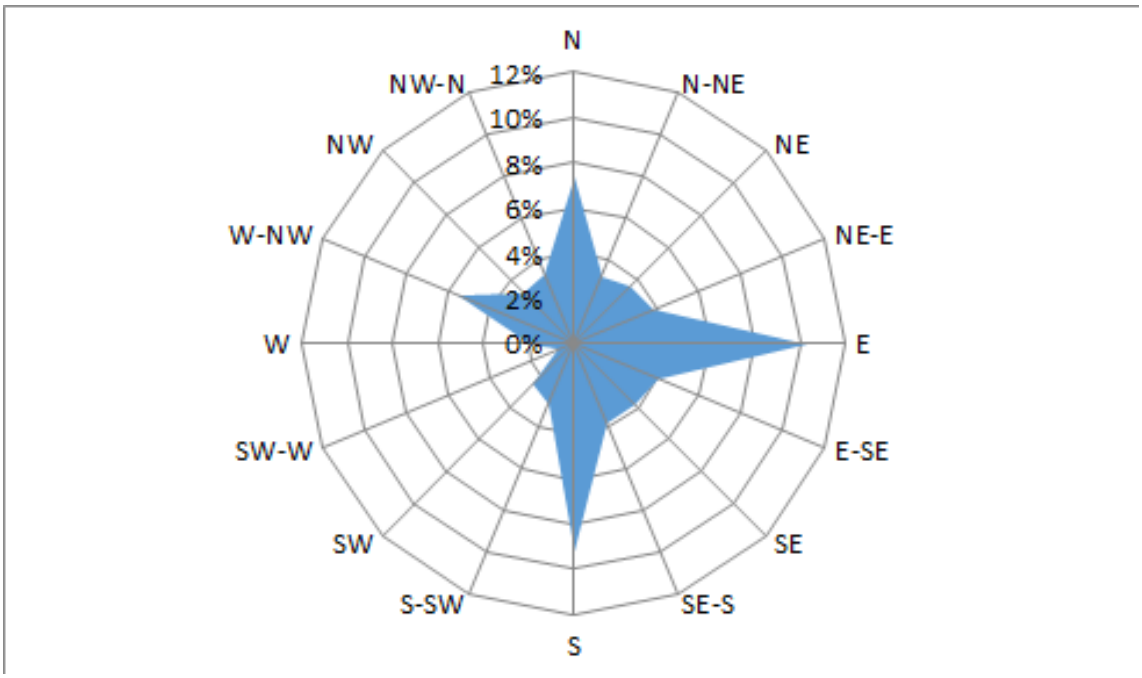

Figure 1.2.1: Wind Rose Graph

Once this step is done, the next thing to do is to calculate the coefficient of use by a diagram of frequencies. Following the recommendations given by the OACI on the attachment 14, the maximum value that the transversal component can achieve is 37km/h or 20 knots for a runway of >1500m. The diagram of frequencies basically creates a rectangular area that depends on the runway axis, the width of the runway and the maximum transversal component. After calculating the coefficient of use by all the directions, the graph obtained is the following:

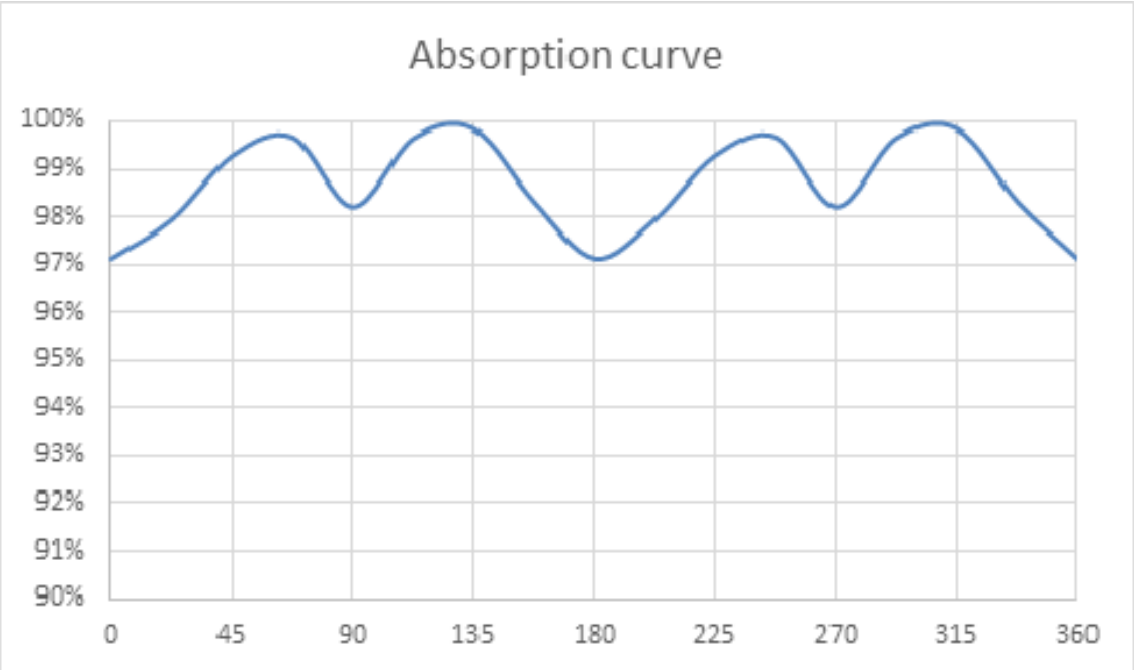

Figure 1.2.2: Coefficient of use depending on the orientation

As it can be see, the coefficient is higher than 95% in any direction. According to that, the final orientation chosen is SE-NW.

2 Runway design

2.1 Introduction

The runway is a key piece of the airport and the air side design due to the fact that defines the maximum dimensions of the operative airplanes. Its function is to successfully guarantee the landing and takeoff operation.

In order to successfully define the runway, the instructions and requirements given in the Annex 14 given by the OACI have been followed.

2.2 Runway Length

The reference field length is defined as the minimum length needed in order to perform a takeoff operation with the maximum homologated takeoff weight using sea level conditions, without wind and considering 0° slope.

In order to calculate the runway length, the first step is to choose the most restrictive airplane that is going to operate on that runway. Afterwards, that length has to be corrected by the runway slope, the altitude of the airport and the mean temperature.

Due to the fact that the airport has two runways, from now on, the runway used for international flights will be referred as runway 1 and the one used for domestic flights will be named runway 2.

2.2.1 Runway 1

The biggest airplanes that will operate on this runway are the Boeing 777-300ER and the Airbus A330-300.

2.2.1.1 Reference Field Length

Starting with the B777-300ER, using the ACAP (Aircraft Characteristic for Airport Planning), the values of the MTOW (Maximum TakeOff Weight) and MLW (Maximum Landing Weight) can be obtained.

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